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I. – INTRODUCTION

Generally Accepted Agricultural and Management Practices for Site Selection and Odor Control for New and Expanding Livestock Production Facilities will help determine the suitability of sites for livestock production facilities. These GAAMPs provide a planning process that can be used to properly plan new and expanding facilities to increase the suitability of a particular site and enhance neighbor relations.

These Generally Accepted Agricultural and Management Practices (GAAMPs) for Site Selection and Odor Control for New and Expanding Livestock Production Facilities are written to provide uniform, statewide standards and acceptable management practices based on sound science.

FARM PLANNING AND SITE DEVELOPMENT

The GAAMPs for site selection and odor control for new and expanding livestock production facilities are intended to fulfill three primary objectives:

- 1) Environmental Protection
- 2) Social Considerations (neighbor relations)
- 3) Economic Viability

When all three of these objectives are met, the ability of a farm operation to achieve agricultural sustainability is greatly increased.

Farm planning involves three broad phases: Collection and analysis (understanding the problems and opportunities); decision making; and implementation. Collection and analysis includes: determining objectives, inventorying resources and analyzing data. Decision support includes formulating alternatives, evaluating alternatives and making decisions. The final step is implementation.

Producers should utilize recognized industry and university professionals in the evaluation of the economic viability and sustainability of constructing new or expanding existing livestock production facilities. This evaluation should be comprehensive enough to consider all aspects of livestock production including economics, resources, operation, waste management and longevity.

The decision of where to site a livestock production facility can be based on several objectives including: preserving water quality, minimizing odor, working with existing land ownership constraints, future land development patterns, maximizing convenience for the operator, maintaining esthetic character, minimizing conflicts with adjacent land uses and complying with other applicable local ordinances. The environmental objectives of these GAAMPs focus specifically on water quality protection and odor control, and how environmental and management factors affect the suitability of sites for livestock

II. - DEFINITIONS

AS REFERENCED IN THESE GAAMPs:

Animal Units - Animal units are defined as listed in (Table 1) of these GAAMPs.

Distances between a Livestock Production Facility and Non-Farm Residences - The distance from a livestock production facility and a residence is measured from the nearest point of the livestock production facility to the nearest point of the residence.

Expanding Livestock Production Facility - An addition to a facility to increase the holding capacity where animals will be confined at a site that presently has livestock production facilities contiguous to the construction site. A new or expanded manure storage structure built to accommodate an expansion in animal units within three years from construction of the manure storage will also be considered an expanding livestock production facility.

Livestock Farm Residence - A residence on land owned/rented by the livestock farm operation and those residences on farms affiliated by contract or agreement with the livestock production facility.

Livestock Production Facilities - Includes all facilities where farm animals as defined in the Right to Farm Act are confined with a capacity of 50 animal units or greater and/or the associated manure storage facilities. Pasture systems are excluded.

New Livestock Production Facilities - All facilities where animals will be confined and/or manure storage structures that are built at new sites and are not part of another livestock production facility, including a site that is expanding greater than 100 percent of existing production within any three year time period and the resulting number of animal units will exceed 749.

Non-Farm Residence - A residence that is habitable for human occupation and is not affiliated with the specific livestock production system.

Pasture Systems - Pasture land is land that is primarily used for the production of forage upon which livestock graze. Pasture land is characterized by a pre-dominance of vegetation consisting of desirable forage. Sites such as loafing areas, confinement areas, or feedlots, which have livestock densities, that preclude a predominance of desirable forage species, are not considered pasture land.

Property Line Setback - Is the distance from the livestock production facility to the property line measured from the facility to the nearest point of the facility owner's property line. If a producer owns land across a road, the road or right of way does not constitute a property line. Local road/property line setbacks apply.

are located where there are five or fewer non-farm residences within ¼ mile from a new livestock production facility with up to 749 animal units, and within ½ mile from a new livestock production facility with 750 animal units or greater. New and expanding livestock production facilities should only be constructed in areas where local zoning allows for agriculture uses.

If the proposed site is within Category 1, it is recognized that this is a site normally acceptable for livestock production facilities. As shown in Table 2, if the proposed site is within Category 1 and has a capacity of 50 to 499 animal units, MDA will review and verify the producer's plans at the producer's request. If the proposed site is within Category 1 and has a capacity of 500 or more animal units, the producer must follow the MDA site selection review and verification process as described in Section V. Category 1 sites with less than 1000 animal units which are able to meet the property line setbacks as listed in Tables 2 and 3, as appropriate, and which meet the other requirements of these GAAMPs, are generally considered as acceptable for Site Selection Verification. An Odor Management Plan (OMP) will not be required for these sites in most circumstances. It is however, recommended that all producers develop and implement an OMP in order to reduce odor concerns for neighboring non-farm residents.

A request to reduce the property line setbacks, as listed in Tables 2 and 3, will require the development of an OMP for verification. All verification requests for Category 1 sites with 1000 animal units or greater will require the development and implementation of an OMP.

Table 2. Category 1 Site Setbacks, Verification and Notification – New Operations

Total Animal Unit	New Operations Non-Farm Residences within Distance	Property Line Setback¹	MDA Site Review and Verification Process
50-499	0-5 within ¼ mile	250 ft	Upon Producer Request ²
500-749	0-5 within ¼ mile	400 ft	Yes
750-999	0-5 within ½ mile	400 ft	Yes
1000 or more	0-5 within ½ mile	600 ft	Yes

¹May be reduced based upon the Odor Management Plan.

²To be afforded nuisance protection under the Right to Farm Act, producers must conform to all requirements of the GAAMPs but are not required to complete the site review and verification process if less than 500 animal units.

Table 4. Category 2 Site Setbacks, Verification and Notification – New Operations

Total Animal Units	For new Operations Non-Farm Residences Within Distance	Property Line Setback¹	MDA Site Review and Verification Process
50-249	6-13 within ¼ mile	250 ft	Upon Producer Request ²
250-499	6-13 within ¼ mile	300 ft	Yes
500-749	6-13 within ¼ mile	400 ft	Yes
750-999	6-13 within ½ mile	500 ft	Yes
1000 or more	6-13 within ½ mile	600 ft	Yes

¹ May be reduced based upon the Odor Management Plan.

² To be afforded nuisance protection under the Right to Farm Act, producers must conform to all applicable GAAMPs but are not required to complete the site review and verification process if less than 250 animal units.

Table 5. Category 2 Site Setbacks, Verification and Notification – Expanding Operations

Total Animal Units	For Expanding Operations Non-Farm Residences within Distance	Property Line Setback¹	MDA Site Review and Verification Process
50-249	8- 20 within ¼ mile	125 ft	Upon Producer Request ²
250-499	8- 20 within ¼ mile	200 ft	Yes
500-749	8- 20 within ¼ mile	200 ft	Yes
750-999	8- 20 within ½ mile	250 ft	Yes
1000 or more	8- 20 within ½ mile	300 ft	Yes

¹ May be reduced based upon the Odor Management Plan.

² To be afforded nuisance protection under the Right to Farm Act, producers must conform to all applicable GAAMPs but are not required to complete the site review and verification process if less than 250 animal units.

community surface water source is located, unless the livestock production facility is located downstream of the surface water intake.

2. High public use areas - Areas of high public use or where a high population density exists are subject to setbacks to minimize the potential effects of a livestock production facility on the people that use these areas. New livestock production facilities should not be constructed within 1500 feet of hospitals, churches, licensed commercial elder care facilities, licensed commercial childcare facilities, school buildings, commercial zones, parks or campgrounds. Existing livestock production facilities may be expanded within 1500 feet of high public use areas with appropriate MDA review and verification. The review process will include input from the local unit of government and from people who utilize those high public use areas within the 1500-foot setback.
3. Residential zones - Areas that are zoned primarily for residential use will generally have housing at a density that necessitates setback distances for livestock production facilities to prevent conflicts. New livestock production facilities shall not be constructed within 1500 feet of areas zoned for residential use where agriculture uses are excluded. Existing livestock production facilities may be expanded within 1500 feet of areas zoned for residential use with approval from the local unit of government.

IV. - DEVELOPING A SITE PLAN AND A MANURE MANAGEMENT SYSTEM PLAN

Site Plan

A Site Plan is a comprehensive layout for a livestock production facility, and includes:

- A site map including the following features (to scale):
 - ~ Property lines, easements, rights-of-way, and any deed restrictions.
 - ~ Public utilities, overhead power lines, cable, pipelines, and legally established public drains.
 - ~ Positions of buildings, wells, septic systems, culverts, drains and waterways, walls, fences, roads, and other paved areas.
 - ~ Location, type and size of existing utilities.
 - ~ Location of wetlands, streams and other bodies of water.
- Existing land uses for contiguous land.
- Names and addresses of adjacent property owners.
- Basis of livestock production facility design.
- Size and location of structures.
- A soils map of the area where all livestock production facilities are located.
- Location and distance to the non-farm residences within one-half mile.

~Veterinary Waste Management Plan - Identify the processes and procedures used to safely dispose of livestock-related veterinary wastes produced on the farm.

~Conservation Plan - Field-specific plan describing the structural, vegetative and management measures for the fields where manure and other by-products will be applied.

~Mortality Management Plan - Identify the processes and procedures used to safely dispose of the bodies of dead animals (Bodies of Dead Animals Act PA 239 of 1994, as amended).

V. - SITE REVIEW AND VERIFICATION PROCESS

The GAAMPs for Site Selection and Odor Control for New and Expanding Livestock Production Facilities are applicable for producers with new and expanding livestock production facilities with a capacity of 50 animal units or greater (see Table 1), who are seeking nuisance protection under the Right to Farm Act. Producers with facilities that require MDA verification in categories 1, 2, or 3 should contact the MDA and begin the site selection review and verification process prior to the construction of new livestock production facilities and expansion of existing livestock production facilities.

Producers with new and expanding livestock production facilities that have a total capacity less than 50 animal units may request siting verification from MDA. The MDA site review and verification process will use criteria applicable to a 50 animal unit facility for these requests.

To begin the review and verification process, contact the Michigan Department of Agriculture Right to Farm Program at (877) 632-1783. This toll free number is operational during normal business hours.

The following steps outline this process:

1) Application for Siting Verification:

A request to begin the site review and verification process can be made by submitting a letter from the responsible party to the MDA Right to Farm Program. This letter should outline the proposed new construction or expansion project, any areas of concern, agencies and individuals the producer is already working with, and the proposed timeline. The responsible party must also submit a complete site verification request. A request application and a checklist are available at www.michigan.gov/mda/gaamps. The checklist will assist you in identifying environmental or social areas of concern. If special technologies or management practices are to be implemented for the successful operation of the livestock production facility, these must be included in the siting request package.

Site Suitability Approval:

If either the owner of the proposed livestock production facility, or any surrounding neighbor within one mile of the proposed facility, or the local unit of government in which the facility is located, disagrees with the site suitability determination, they may request MDA's decision be reviewed by the Michigan Commission of Agriculture within 60 days of the date this determination is issued. The request shall be in writing and include supporting documentation. MDA will review the supporting documentation and then will consult with at least three recognized professionals in the siting and management of livestock production facilities and odor control practices as listed below to further evaluate the proposed siting request. MDA will notify the professionals of the request. The professionals shall review and report a recommendation for a response to the requested review, to the Commission of Agriculture, within 60 days of receipt of the written review request. An extension may be granted by the Commission of Agriculture. Upon receipt and review of the professional's recommendation, the Commission of Agriculture will recommend to the Director of the Michigan Department of Agriculture whether to affirm or re-evaluate the site suitability determination. The final decision rests with the Director. This review process is created solely for the purpose of this specific GAAMP, and the Administrative Procedures Act does not apply.

Recognized Professionals:

Recognized professionals in the siting and management of livestock production and odor control practices may include, but are not limited to personnel from the following:

- a. Conservation Districts
- b. Industry Representatives
- c. Michigan Department of Environmental Quality
- d. Professional Consultants and Contractors
- e. Professional Engineers
- f. United States Department of Agriculture - Natural Resources
Conservation Service
- g. University Agricultural Engineers and other University Specialists

The site review and verification process will be conducted in accordance with MDA procedures and protocol.

For odor sources not addressed by Michigan OFFSET, a subjective potential odor magnitude evaluation of high, medium, or low, relative to other odor sources on the farm should be conducted.

3. Analyze potential odor impact on neighboring residences and other non-farm areas with Michigan OFFSET, utilizing the 95 percent odor annoyance-free level, and evaluate the conclusions as follows:

- Identify specific odor impact on neighboring residences, utilizing OFFSET results and other site-specific odor impact considerations.
- Assess the magnitude of potential odor-based conflict.
- Develop an appropriate conflict abatement strategy for each odor-sensitive area of concern which may include:
- Signed letter from property owner consenting to approval of the new or expanded facility.
- Description of intensified community relations practices for these homes or other odor sensitive areas.
- Explanation of specific variables in Michigan OFFSET that may reduce the concern, such as, variables in terrain, wind velocity, facility layout, variation of facility from typical, and odor management practices not credited in Michigan OFFSET.

4. Identify management systems and practices for odor control including:

- Practices currently being implemented.
- New practices that are planned for implementation.
- Practices that will be considered, if odor concerns arise.

There are numerous odor reduction practices available; however, not all have been proven equally effective. Some practices may reduce odor from one part of the system, but increase it in another. For example, long-term manure storage will reduce the frequency of agitation of the storage thus producing less frequent odor events, but will likely result in greater intensity and offensiveness of each odor event.

Each farm situation is unique and requires site-specific identification and implementation of odor reduction practices to suit the practical and economic limitations of a specific farm.

Simple changes in management, such as, but not limited to, improving farmstead drainage, collecting spilled feed, and regular fan maintenance will reduce overall farmstead odor.

“Practices that will be considered, if odor concerns increase” should include only those odor management practices that the producer would seriously consider implementing, if the need arose.

Improved management, as well as the adoption of new technologies to control odor offer a means for reducing odor from livestock production facilities and manure storage facilities, thus broadening the potential area within which livestock production facilities may be appropriately sited. Odor reduction technologies continue to evolve. Current technologies include, but are not limited to, vent bio-filters, manure storage covers, and composting.

APPENDIX B

The Odor Management Plan includes the following text and tables and output from Michigan OFFSET, which is not shown here.

Example Dairy Odor Management Plan

Overview

The existing 1,200 cow facility is expanding to 1,700 cows. The proposed expansion involves the addition of another 500 cow freestall barn, expansion of the primary sand-laden manure storage, and the addition of another earthen storage for milking center wastewater. All of the additional facilities are located to the south and west of the existing facility.

Odor Source Identification & Assessment

Refer to attached Odor Source Assessment table

Odor Management Practices

Refer to attached Odor Management Practices table

Potential Odor Impact Analysis

Michigan OFFSET has identified two homes not associated with the farm that are definitely within the odor impact zone prior to the expansion and three additional homes that are likely impacted (see MI-OFFSET output). An additional five homes are added to the odor awareness zone as a result of the proposed expansion.

The potentially odor impacted homes are at the following addresses:

(List addresses and homeowner names in order of proximity to odor source.)

All homeowners, with the exception of one, have signed a letter acknowledging the proposed expansion and indicating that they do not object to it proceeding. The lone exception is the residence at *(list address)*. This resident was reluctant to sign a letter, but has verbally accepted the expansion. He is also a livestock producer whose odor awareness zone from Michigan OFFSET would likely overlap the dairy farms. He also has a working relationship with the Example Dairy as a producer of corn grain for dairy feed.

Of the other homes in the odor awareness zone, three are currently or very recently have been active dairy farmers themselves. Another is a landlord of property that is rented and included in the farm CNMP/MMSP.

The three remaining homes are the most distant from the center of the odor awareness zone and furthest from the specific area of the facility expansion.

Odor Source Assessment – proposed facility

Potential Odor Source	Description	Odor Emission Number ¹	Odor Control Factors ²			Odor Emission Factors ^{1,3}		
			current	planned	potential	current	planned	potential
Large Manure storage	Sand Land Manure storage for center-drive through barns (170 x 340)	13	0.5 + NV			168.9		
Freestall Barns	Freestall barns (187,104 sq. ft.)	6		NV		112.3		
Milking Center Wastewater	Earthen storages for milking center wastewater. Is recycled to flush holding and treatment areas (49,600 sq. ft.)	13	NV		0.1	50.4		5.0
Run Off Storage	Collects rain runoff from open lot and silage pads (90 x 120)	13	NV			14		
Outside Lots	Outside concrete housing lot (16,200 sq. ft.)	4			NV	6.5		
Settling basins	Holding area flushed material settling area prior to pumping of liquid to milking center wastewater storage (30 x 60)	28	NV	NV	NV	5		
Bedded open housing barns	Maternity & sick pens (22,620 sq. ft.)	2				4.5		
Open Lot Manure storage	Short-term manure storage (70 x 20)	13	0.5 + NV			.9		
Agitation	Agitation of manure storages	Medium				M	M	M
Land Application	Field application of liquid manure	High	NV			M	M	M
Silage & Feed Storage	Concrete pad and bunker silos (300 x 350)	Medium	NV			L	L	L

1. OFFSET value if available or High, Medium, Low for sources not addressed in OFFSET

2. NV = No Value available in OFFSET; however, a defendable odor control factor is applicable per Odor Management Practices table.

3. Odor Emission Factors are equal to the odor emission number, multiplied by the surface area (ft²) and odor control factor, divided by 10,000.

Odor Management Practices (cont'd)

Land Application	1. Manure is injected or incorporated whenever field conditions permit.		
Silage & Feed Storage	2. Weekend and holiday application is avoided.		
	1. Silage piles are covered with plastic with clean water diverted off of the pile.		
	2. Forages harvested at recommended moisture.		
	3. Concrete pad is mechanically swept at least once per week.		

3. A livestock production facility that a) applies for coverage with the MDEQ's National Pollutant Discharge Elimination System (NPDES) permit, or b) is directed by MDEQ on a case by case basis.

For additional information regarding the permit, go to: www.michigan.gov/deg

For additional information regarding MAEAP, go to: www.maeap.org or telephone (517) 241-4730.

VI. - REFERENCES

The Generally Accepted Agricultural and Management Practices for Manure Management and Utilization.

Jacobsen, Larry and Huiqing Guo. *An Odor Setback Estimator for Feedlots (OSEFF)*. BAE Department, University of Minnesota. (Minnesota Odor Estimator Model).

Jacobson, Larry; Huiqing Guo; Schmidt, David; Nicolai, Richard; Zhu, Jun; and Janni, Kevin. *Worksheet for the Odor Rating System to Estimate Setback Distances for Animal Production Sites*. Version 1.0. BAE Department. University of Minnesota. (Minnesota Odor Estimator Model).

The Michigan Natural Resources and Environmental Protection Act (PA 451 of 1994).

Michigan Right to Farm Act, PA 93 of 1981, as amended.

National Pork Producers Council On-Farm Odor Assessment Program.

United States Department of Agriculture, Natural Resources Conservation Service, *Field Office Technical Guide*.

United States Department of Agriculture, Natural Resources Conservation Service, *Agricultural Waste Management Field Handbook*.



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